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Bingisser

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[54] **EXERCISING APPARATUS**

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[51] **Int. Cl.**[3] **A63B 21/22**

[52] **U.S. Cl.** **272/131;** 272/132; 272/140

[58] **Field of Search** ..... 272/116–117, 272/126, 130–132, 142–143, 138, 140; 242/107.3, 99, 107; 192/12 R, 12 A, 12 B, 41 R; 254/364

[56] **References Cited**

U.S. PATENT DOCUMENTS

518,967	5/1894	Poole	272/132
2,725,231	11/1955	Hoover	272/130 X
3,211,453	10/1965	Williams	272/131 X
3,995,853	12/1976	Deluty	272/132
4,174,832	11/1979	Thompson	272/140 X

FOREIGN PATENT DOCUMENTS

2274322	2/1976	France	272/132

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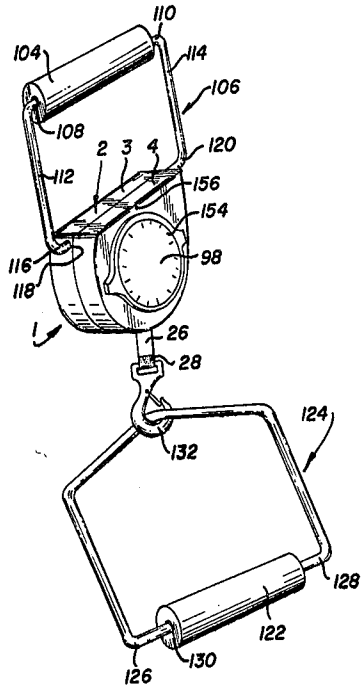
Assistant Examiner—Chris Coppens
Attorney, Agent, or Firm—Carver & Co.

[57] **ABSTRACT**

An exercising apparatus has a hollow housing with an aperture extending therethrough and a cavity on one side. The cavity has a cylindrical portion and at least one slot portion extending outwardly at the edge of the cylindrical portion. A first handle is connected to the housing. An axle, with a round portion and a square portion, extends rotatably through the aperture. A bolt extends through a longitudinal aperture through the axle. The round portion of the axle extends through a pulley wheel in the hollow housing. There is a one way clutch between the pulley wheel and the round portion of the axle. A strap, normally wound about the pulley, wheel extends from an opening in the housing. A spiral spring within the housing biases the pulley wheel to wind the strap. There is a set of at least three friction discs proportioned to fit freely and removably within the cavity of the housing. A rotatable metal disc has a square central aperture for rotation with the square portion of the axle. A non-rotatable metal disc has a round central aperture and an outwardly extending projection shaped to fit within the slot portion of the cavity. A leather disc between the metal discs has a round central aperture. There is a knob threaded onto the bolt to compress the friction discs between the knob and the housing. The knob is removable to permit the set of friction discs to be replaced.

7 Claims, 4 Drawing Figures



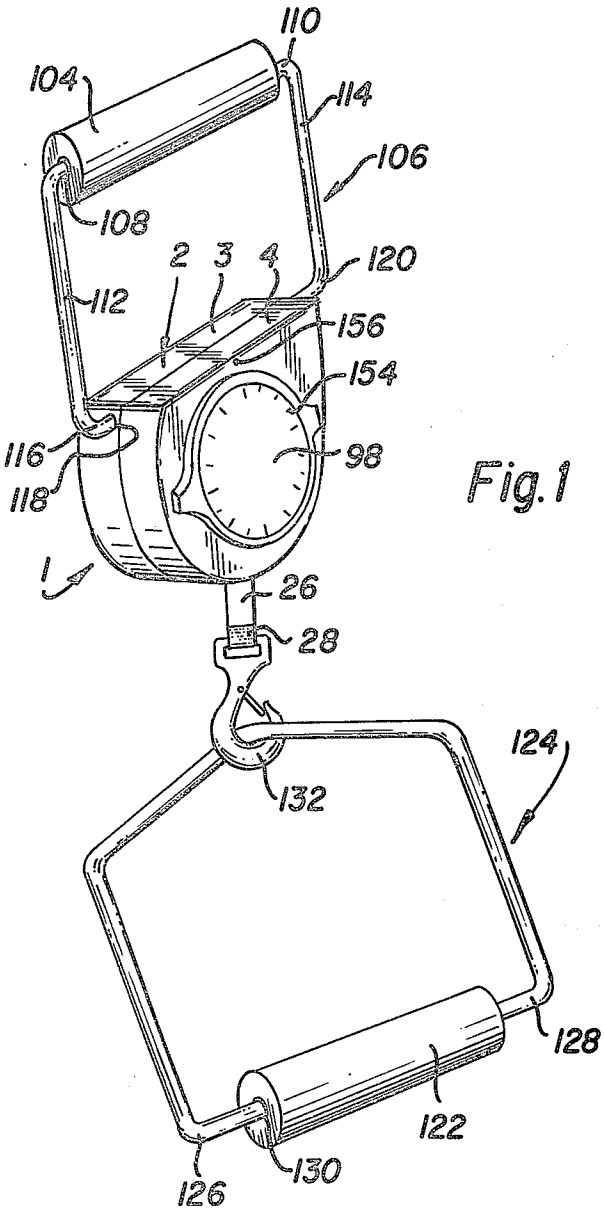

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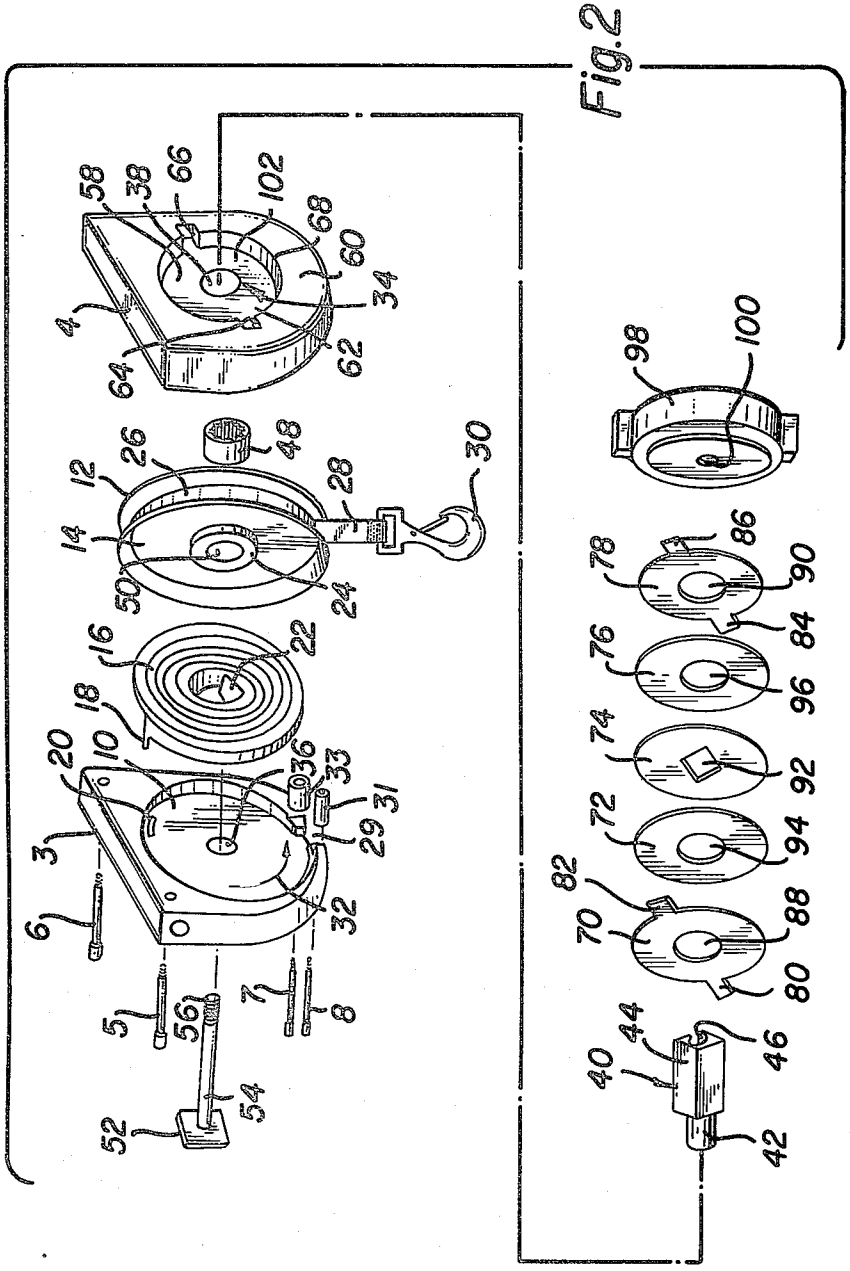
Fig. 1

Fig. 2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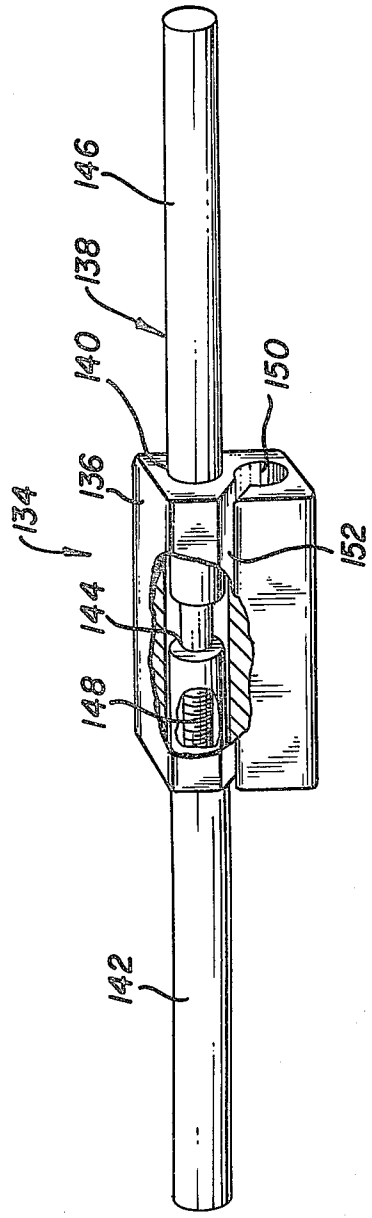

Fig. 3

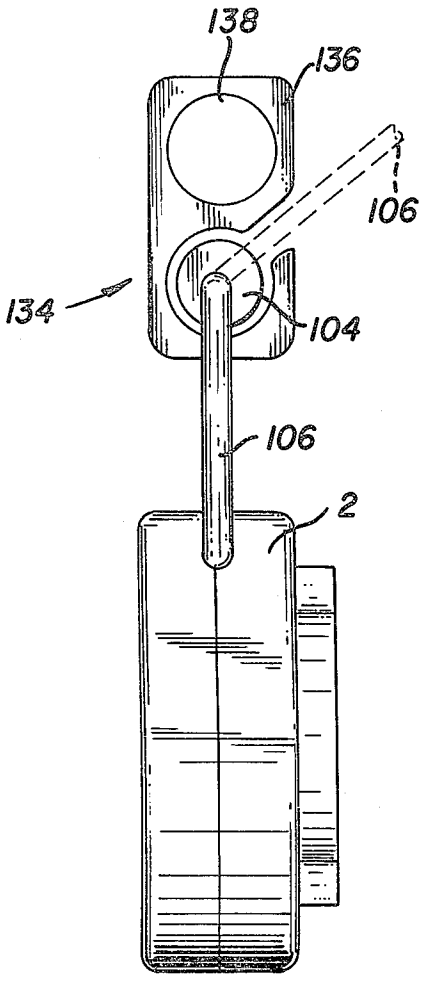

Fig. 4

EXERCISING APPARATUS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to an exercising apparatus including a housing with a plurality of friction discs and a pulley wheel wound with a strap and resiliently biased to the wound position.

2. Prior Art

Devices of the general class have been developed in the past which include a housing, a resiliently biased pulley wheel wound with a strap, friction discs for resisting rotation of the pulley wheel and unwinding of the strap, handle means on the housing and another handle means connected to the strap. For example, a device of this type shown is shown in U.S. Pat. No. 3,995,853 to Deluty. Other devices of the general type are shown in U.S. Pat. No. 518,967 to Poole and U.S. Pat. No. 3,103,357 to Bern.

Previous devices of this class have offered certain disadvantages or features which have limited their usefulness or popularity. For example, referring to the Deluty patent, the friction discs are located within the housing so the device would have to be disassembled to replace the discs. This is disadvantageous because it would be desirable to permit quick replacement of a set of discs with another set of discs capable of exerting an appreciatably different frictional force. For example, an apparatus owned by a family could have one set of discs which exert a stronger force for a man and another set with a much weaker force for children. While these devices do normally permit some adjustment of the frictional force, replacing the entire set of discs would offer a much greater potential range of forces. In addition, sometimes the friction discs become contaminated and lose their proper frictional properties. It would be desirable to quickly change these discs but this would not be possible with the Deluty device.

SUMMARY OF THE INVENTION

According to the invention, an exercising apparatus comprises a hollow housing having an aperture extending therethrough and a cavity on one side. The cavity has a cylindrical central portion, the aperture communicating with the center of the cylindrical portion, and at least one slot portion extending outwardly at the edge of the central portion. A first handle means is connected to the housing. An axle extends rotatably through the aperture and the housing, the axle having a first portion which is round in section, a second portion extending through the cavity which is square in section, and a longitudinal central aperture. Bolt means extends through the aperture of the axle and has a threaded portion extending axially from the second portion. A pulley wheel within the hollow housing has a central aperture. The first portion of the axle extends through the aperture of the pulley wheel. There is one way clutch means between the pulley wheel and the first portion of the axle. The one way clutch permits free rotation of the pulley wheel in a first direction of rotation and locks the pulley wheel to rotate with the axle in a second direction of rotation which is opposite the first direction. There is strap means connected to, and normally wound about, the pulley wheel having a free end extending from an opening in the housing. A spiral spring within the hollow housing is connected to the housing and the pulley wheel to bias the pulley wheel in the first direction of rotation to wind the strap means on the pulley wheel. A set of at least three adjacent friction discs is proportioned to fit freely and removably within the cavity of the housing. A first non-rotatable metal disc has an outwardly extending projection shaped to fit within the slot portion of the cavity. A rotatable metal disc with a square central aperture receives the second portion of the axle so the center disc rotates with the axle. There is a first leather disc between the metal discs. The leather disc and the non-rotatable disc each has a circular central aperture permitting rotation between said each disc and the axle. There is knob means having a threaded aperture for threading the knob means onto the bolt means. The friction discs are pressed together within the cavity between the knob means and the housing when the knob means is tightened on the bolt means. The knob means is removable from the bolt means to permit replacement of the set of friction discs.

DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. **1** is an isometric view of an exercising apparatus according to an embodiment of the invention,

FIG. **2** is an exploded perspective view thereof,

FIG. **3** is an isometric view of an elongate handle means for connecting to the apparatus; and,

FIG. **4** is a side view of the apparatus connected to the elongate handle means.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. **1** shows an exercising apparatus **1** according to the invention in assembled form. The apparatus includes a housing **2** which can be made of plastic or metal for example. The housing is formed by two halves **3** and **4** which are held together by bolts **5**, **6**, **7** and **8** shown in the exploded view of FIG. **2**. The housing is hollow having an interior cavity **10** formed in housing half **3** between housing half **3** and housing half **4**. A pulley wheel **12**, slightly smaller in diameter than cavity **10**, is rotatably received within the cavity. A cylindrical recess **14** is formed in the side of pulley wheel **12** facing housing half **3**. A spiral spring **16** fits within recess **14** when the pulley wheel is in interior cavity **10**. A laterally projecting tab **18** on the spiral spring fits within a slot **20** in housing half **3** to connect the spiral spring to the housing. A radially extending tab **22** near the center of the sprial spring fits within a slit **24** in the pulley wheel to connect the spiral spring to the pulley wheel.

A strap **26**, made of nylon webbing or similar strong material, is wound on the pulley wheel. The inner end of the strap is connected to the pulley wheel, while the outer free end **28** is connected to a safety-type hook connector **30**. Free end **28** extends through a slot **29** in the housing between rollers **31** and **33** which are rotatably mounted on bolts **8** and **7**. The spiral spring **16** is wound in a direction to bias the pulley wheel in a first direction indicated by the arrow **32** in FIG. **2** such as to wind the strap onto the pulley.

The housing has an aperture extending therethrough shown generally at **34**. Aperture **34** consists of a first aperture portion **36** in housing half **3** and a second aperture portion **38** in housing half **4**. An axle **40** extends rotatably through the center of the housing. The axle has a first portion **42** which is round in section and a second portion **44** which is square in section. The axle

also has a longitudinal central aperture **46**. The first portion **42** extends between housing halves **3** and **4**. A cam lock **48** is fitted over first portion **42**, providing one way clutch means. The cam lock freely rotates on axle portion **42** in the first direction indicated by arrow **32**. However, in the conventional manner, the cam lock locks onto the axle in a second direction of rotation which is opposite the direction indicated by arrow **32**. The cam lock **48** is fitted tightly and non-rotatably within central aperture **50** of the pulley wheel. Thus, the cam lock permits free rotation of the pulley wheel about the axle in the first direction of rotation shown by arrow **32**, but locks the pulley wheel to the axle in the opposite direction of rotation.

There is a bolt **52** having a shaft **54** extending through aperture **36** in housing half **3** and rotatably through central aperture **46** of axle **40**. A threaded outer portion **56** of the bolt extends axially outwards from the second portion **44** of the axle.

The second portion **44** of the axle, which is square in section, projects into a cavity **58** extending inwardly from side **60** of housing half **4**. The cavity has a central portion **62** which is cylindrical in shape. In addition, the cavity has a pair of slot portions **64** and **66** which extend radially outwards from the edge **68** of the central portion.

The apparatus has a set of five adjacent friction discs **70–78** inclusive. The set is proportioned to fit freely and removably within the cavity **58**. The non-rotatable, outer discs **70** and **78** are of metal. Disc **70** has a pair of outwardly extending projections **80** and **82** shaped to fit within slot portions **64** and **66** of cavity **58**. Disc **78** has corresponding projections **84** and **86**. Disc **70** has a central aperture **88** large enough to permit free rotation of square axle portion **44** within the aperture. Disc **78** has a similar sized circular central aperture **90**.

The rotatable center disc **74** is also of metal, but has no projections for fitting within slot portions **64** and **66**. In addition, disc **74** has a square central aperture **92** shaped to fit over the square second portion **44** of the axle. The remaining pair of discs **72** and **76** are of leather. Disc **72** fits between outer disc **70** and center disc **74**, while leather disc **76** fits between outer disc **78** and center disc **74**. Disc **72** has a circular aperture **94** sufficiently large enough to permit rotation of square second portion **44** of the axle within the aperture. Disc **76** has a similar sized circular central aperture **96**.

A knob **98** has a threaded aperture **100** which in normal use is threaded onto the threaded portion **56** of bolt **52** projecting outwardly from the aperture **46** of the axle. The knob is turned to thread the knob onto bolt **52** and thus press together the friction discs between the knob and annular wall **102** of the cavity **58**. The leather discs are compressed between the metal discs. The knob may be removed from the apparatus by unscrewing the knob from threaded portion **56** of bolt **52**. Once, removed, the entire set of discs **70–78** can be removed and replaced.

The apparatus has a first cylindrical handle **104** connected to housing **2** by a U-shaped connector **106** formed by a metal rod. The handle **104** has a central aperture **108** received rotatably on outer straight portion **110** of the connector. The connector has side portions **112** and **114** which extend at right angles from the outer straight portion. A stub inner portion **116** extends at a right angle inwardly from side portion **112** and rotatably into aperture **118** in housing half **3**. Side portion **114** has a similar stub inner portion **120** fitting rotatably within another aperture in the opposite end of housing half **3**.

A second roller-shaped handle **122** is rotatably mounted on another U-shaped connecter **124**. However, in this case, stub portions **126** and **128** of the connector fit within aperture **130** of the handle. The portion of the U-shaped connector **124** opposite handle **122** has a center bend **132** which tends to keep handle **122** centered relative to hook connector **30**.

Optionally, the apparatus may include an elongate bar means **134** shown in FIGS. **3** and **4**. The bar means has a fitting **136** for connecting the bar means to one of the handles **104** or **122**. There is also an elongate bar **138** passing through longitudinal aperture **140** of the fitting. The bar **136** comprises a first portion **142** with a threaded aperture **144** and a second portion **146** with a threaded projection **148** threadedly received within aperture **144** of the first portion **142**.

Fitting **136** has a second longitudinal aperture **150** parallel to elongate bar **138**. Aperture **150** is of such a size to receive one of the handles **104** or **122**. A slot **152** communicates outwardly from the aperture **150** and is shaped to allow clearance for connector **106** or **124** as one of the handles is slid into the fitting from one end of the elongate aperture. For example, handle **104** is shown received in the fitting in FIG.**4**.

Referring to FIG. **1**, indicia in the form of dial **154** is inscribed on knob **98**. The dial can be used to adjust the force of the friction discs with reference to a fixed indicia **156** on housing **2**. The more the knob is tightened, the greater the friction and the greater the force necessary to pull strap **26** outwardly from the housing.

In order to obtain greater variation in the range of friction, the complete set of discs may be changed. For example, a smaller force is obtained by using another set of discs of smaller diameter. Alternatively, fewer discs may be used. Discs **76** and **78** could be omitted for example to provide a minimum set of three discs to provide some, though a reduced, frictional resistance. Alternatively, by using thinner discs more can be added to increase the force. Another leather disc such as disc **72**, can be place over the shaft outwardly from disc **78**, another center disc, such as disc **72**, is then positioned followed by another leather disc and finally another outer disc such as disc **70**. The knob **98** is then screwed back into position. Discs removed can be replaced by cardboard blanks which provide no significant frictional resistance. The complete set of discs may be removed to utilize the spring force only. This is usually sufficient for two handed exercises for women.

The exercising apparatus utilizes the frictional force between the friction discs to resist outward pulling of the strap **26** from the housing. After the strap is pulled out to the desired length, cam lock **48** permits spiral spring **16** to rotate pulley wheel **12** and rewind the strap onto the pulley wheel once the user stops exerting a force on the strap.

WHAT IS CLAIMED IS:

1. An exercising apparatus comprising:

(a) a hollow housing having an aperture extending therethrough and a cavity on one side, the cavity having a cylindrical central portion, the aperture communicating with the center of the cylindrical portion, and at least one slot portion extending outwardly at the edge of the central portion;

(b) a first handle means connected to the housing;

(c) an axle extending rotatably through the center of the housing, the axle having a first portion which is

round in section, a second portion, which is square in section, extending through the cavity, and a longitudinal central aperture;

(d) bolt means extending through the aperture of the axle and having a threaded portion extending axially from the second portion;

(e) a pulley wheel within a hollow housing, the pulley wheel having a central aperture, the first portion of the axle extending through the aperture of the pulley wheel;

(f) one way clutch means between the pulley wheel and the first portion of the axle, the one way clutch means permitting free rotation of the pulley wheel in a first direction of rotation and locking the pulley to rotate with the axle in a second direction of rotation which is opposite the first direction;

(g) strap means connected to, and normally wound about, the pulley wheel, the strap means having a free end extending from an opening in the housing;

(h) a spiral spring within the hollow housing and connecting the housing and the pulley wheel to bias the pulley wheel in the first direction of rotation to wind the strap means on the pulley wheel;

(i) a set of at least three adjacent friction discs proportioned to fit freely and removeably within the cavity of the housing, a first non-rotatable metal disc having an outwardly extending projection shaped to fit within the slot portion of the cavity, a a rotatable metal disc with a square central aperture for receiving the second portion of the axle so the center disc rotates with the axle, and a first leather disc between the metal discs, each of the leather disc and the non-rotatable disc having a circular central aperture permitting rotation between said each disc and the axle; and,

(j) knob means having a threaded aperture for threading the knob means onto the threaded portion of the bolt means, the friction discs being pressed together within the cavity between the knob means and the housing when the knob means is tightened on the bolt means, the knob means being removable from the bolt means to permit replacement of the set of friction discs.

2. An apparatus as claimed in claim 1, further comprising means on a free end of the strap means for connecting a second handle means to the apparatus.

3. An apparatus as claimed in claim 1, further comprising a second handle means connected to the free end of the strap means.

4. An apparatus as claimed in claim 2, further comprising an elongate bar means with a fitting for connecting the bar means to one of the handle means.

5. An apparatus as claimed in claim 4, wherein the one handle means has a cylindrical handle hingedly connected to the housing by a U-shaped connector and the bar means comprises an elongate bar extending from opposite sides of the fitting, the fitting having an elongate aperture parallel to the bar shaped for receiving the handle and a slot communicating outwardly from the aperture shaped to allow clearance for the connector as the one handle means is slid into the fitting from one end of the elongate aperture.

6. An apparatus as claimed in claim 1, wherein the knob means has a dial for indicating the force of the friction discs reisiting unwinding of the strap means.

7. An apparatus as claimed in claim 1, further comprising a second said leather disc on a side of the rotatable disc opposite the first leather disc and a second said non-rotatable metal disc on a side of the second leather disc opposite the rotatable disc.

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